Dec. 1, 1959 H. RUMSEY, JR 2,914,898

APPARATUS FOR WRAPPER END CLOSURE

Filed May 28, 1956 2 Sheets-Sheet 1

Fig. 1

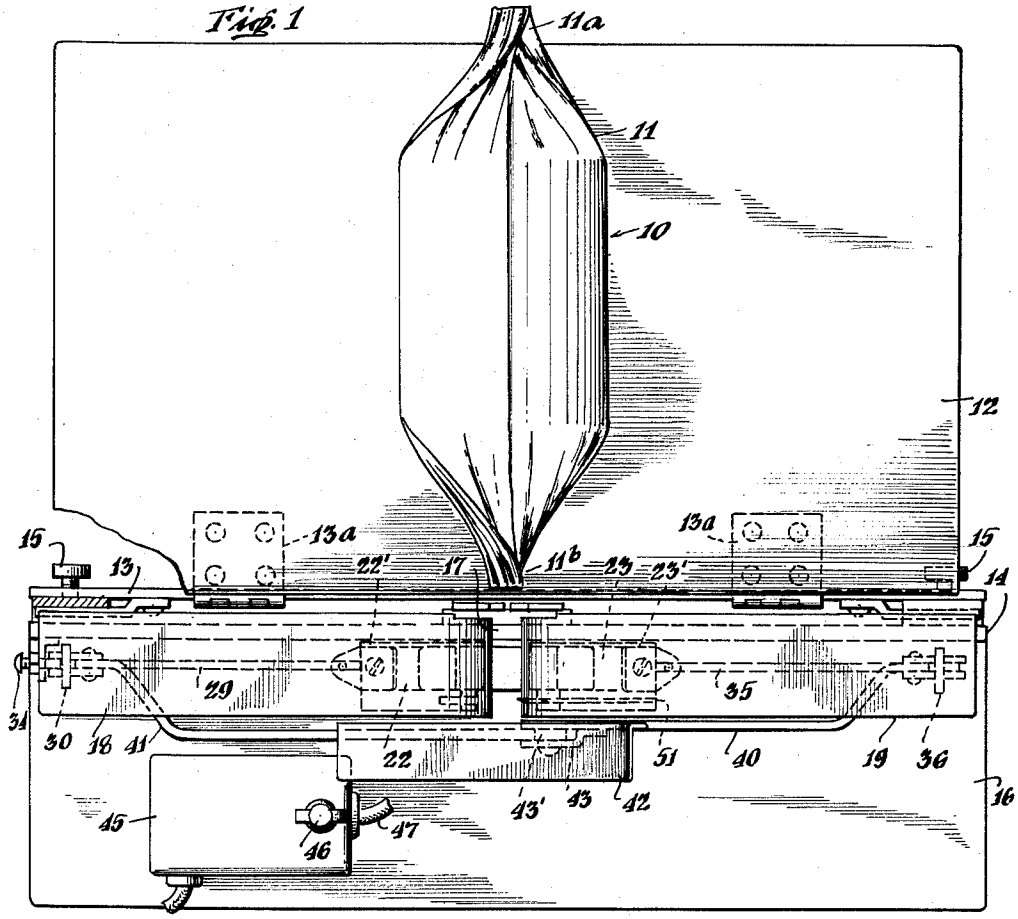
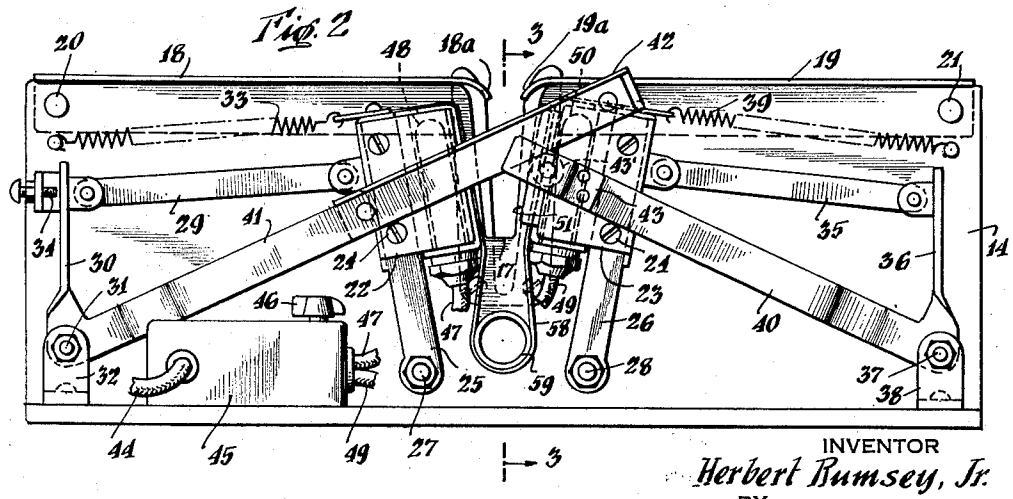


Fig. 2



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Fig. 3

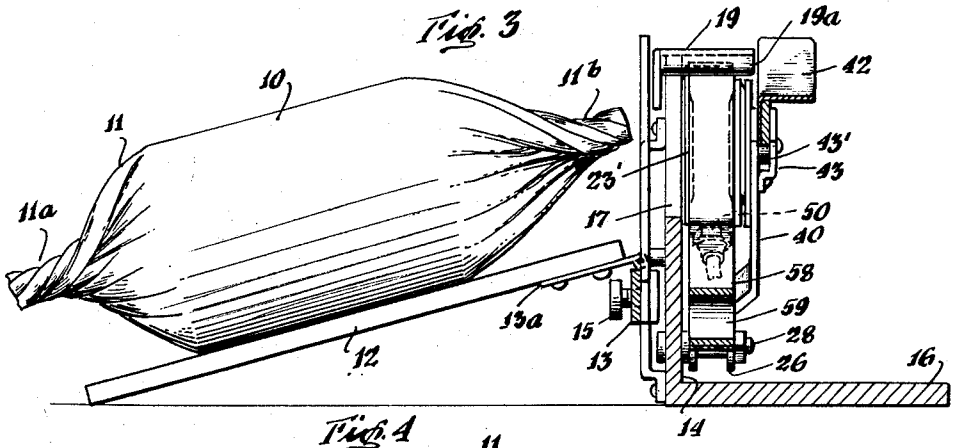


Fig. 4

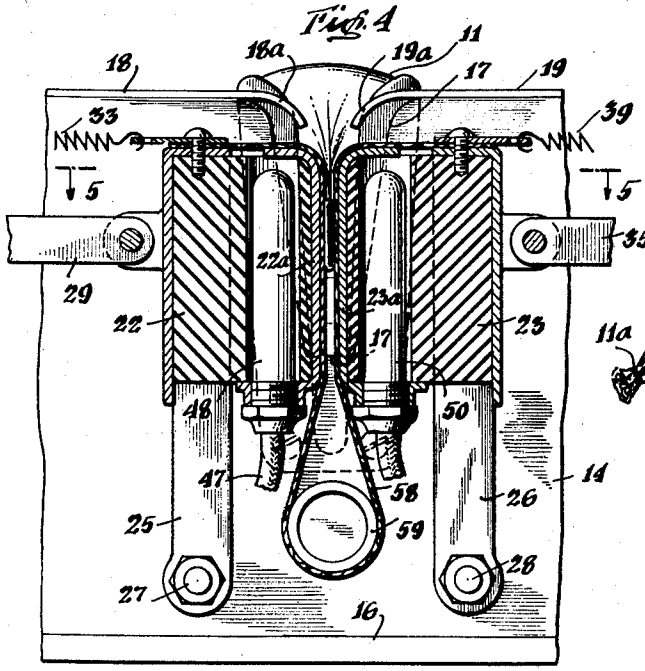


Fig. 6

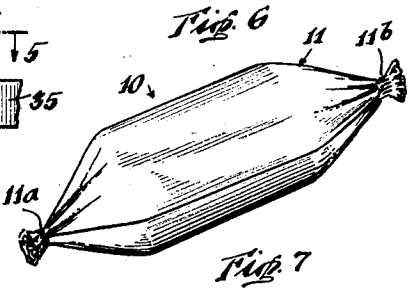


Fig. 7

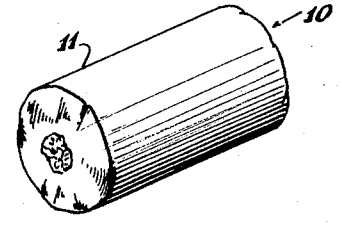


Fig. 5

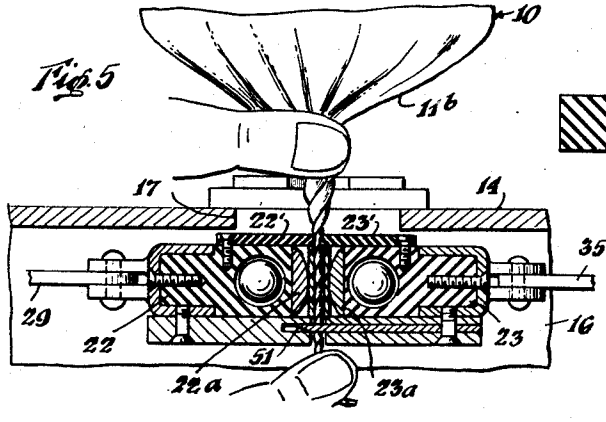
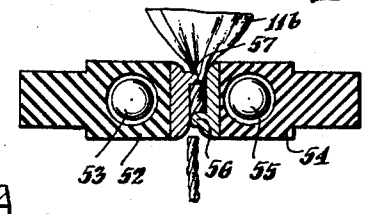


Fig. 8



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APPARATUS FOR WRAPPER END CLOSURE

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Application May 28, 1956, Serial No. 587,805

4 Claims. (Cl. 53—141)

This invention relates generally to apparatus to be used in wrapping material around a package to present an attractive appearance, and more particularly, relates to apparatus for heat closure of the end of the wrapper.

In modern merchandising, it is important that products be attractively packaged when presented to the public. In this connection, it is clearly advantageous to wrap a transparent sheet material around at least a portion of the package so that the food product is displayed therethrough. Where this type of package is employed, the transparent wrapping material is often stretched tightly and made smooth so as to present an attractive appearance and effect. Several types of wrapping materials can be shrunk by subjecting them to heat and these are often used in this industry. As an example, tensilized or oriented rubber hydrochloride, available commercially under the tradename "Pliofilm" and tensilized or oriented polyvinylidene chloride, available commercially under the trademark "Saran" can be used. When this type of wrapping material is employed, it is wrapped rather loosely around the package, the ends of the wrapper are closed and it is thereafter subjected to a predetermined temperature so as to cause it to shrink and thereby tightly encompass the article wrapped therein while causing excess air within the package to be expelled through the overlapping seams of the film.

The invention is herein described with reference to shrinkable wrapping material, however, it is obvious and should be borne in mind that this apparatus and method can be employed for heat sealable films other than those which are heat shrinkable.

The apparatus and method described herein provides a new means for film wrapper end closure. In the past, the methods employed utilized twisted end closure means, but it has been found that certain items to be packaged cannot be efficiently handled by the twisting equipment because of their larger size, weight, and odd shapes. An example of an item in this category would be a smoked ham or a turkey weighing from 8 to 24 pounds. My invention provides an apparatus and method whereby the ends of film wrappers so used are heat crimped rather than twisted for closure.

The invention herein disclosed has, as its principal object, the provision of an apparatus which permits the application of a high degree of heat to the end of a wrapping film at a predetermined area of the film.

Another object of this invention is the provision of a wrapper end closure apparatus wherein the entry of the wrapper end to an operating position is controllable so as to avoid rupture of the wrapper.

Another object of the present invention is to provide a wrapper end closure apparatus in which heat is applied under pressure.

An object of this invention is to provide a means of applying adjustable sealing temperatures to a film and manual control of pressure at the sealing area to accommodate the heat sealing of a variety of films.

A further object of this invention is the provision of

an apparatus for applying heat, to a wrapper film which contains means for severing the film portion at a predetermined distance from the point of heat application simultaneously with the application of the heat.

The method and apparatus are described herein with reference to the drawings in which:

Fig. 1 is a plan view of the apparatus with a wrapped article positioned thereon;

Fig. 2 is a rear elevation view of the apparatus shown in Fig. 1 illustrating the mechanical structure thereof;

Fig. 3 is a sectional view taken on the lines 3—3 of Fig. 2;

Fig. 4 is a partially sectional detailed view of the closure portion of the apparatus shown in Fig. 1;

Fig. 5 is a partially sectional top view of the heat closure jaws of the apparatus shown in Fig. 1 with a wrapper end inserted therein;

Fig. 6 illustrates a wrapped article after end closure and before shrinkage of the wrapper;

Fig. 7 shows the article shown in Fig. 6 after its wrapper has been shrunk; and

Fig. 8 is a detailed view of an alternate form of jaw structure which can be used in the apparatus shown in Fig. 1.

The apparatus used to practice my invention is illustrated in the figures. In Fig. 1, article **10** which is an article to be wrapped, is enclosed by wrapper **11**. In order for wrapper **11** to completely enclose article **10** ends **11***a* and **11***b* of wrapper **11** must be closed. Wrapper **11** is a film of tensilized or oriented rubber hydrochloride, oriented polyvinylidene chloride or the like.

Article **10** is disposed upon platform **12** which lies at an angle with the horizontal. One end of platform **12** rests on an underlying surface and the other end is supported by support member **13** which is fastened to vertical member **14**. Member **13** is a metal bar which extends horizontal to the underlying surface and which is adjustable in a vertical direction by means of screws **15**. The height of support member **13** above the underlying surface is determined by the size and shape of the wrapped article and the method of determining this distance will be seen below. For the present, however, it should be recognized that platform **12** enables an operator to easily position article **10** in the apparatus. Member **13** and platform **12** are joined together by hinge means **13***a* which allows platform **12** to assume an angle in accordance with the distance bar **13** above the underlying surface.

Vertical member **14** together with base **16** form the mounting structure for the mechanism which comprises my apparatus. Vertical member **14** and base **16** can be formed from any sturdy material and are shown in the figures as being mutually perpendicular, however, it is not necessary that they lie at right angles to each other.

Slot **17** is formed in the center of vertical member **14** and extends vertically from its uppermost portion to a point approximately halfway up from base **16**. Slot **17** is a V-shaped aperture having its broadened portion formed with rounded corners at the edge of member **14** as seen best in Fig. 2.

Top plates **18** and **19** which are identical are pivotally connected to vertical member **14** at **20** and **21** respectively. These plates present a flat shelf-like surface along the upper edge of vertical member **14** and provide arcuate ends **18***a* and **19***a* at the access to slot **17**. The purpose and use of the top plates will be explained below and it will also be observed that the plates are pivotally mounted to allow an operator to more easily obtain access to the structure lying beneath them.

Considering Figs. 2 and 5, it is seen that heating blocks **22** and **23** are mounted at the rear of vertical member **14** in the vicinity of slot **17**. The heating blocks lie beneath

the top plates and each heating block has surfaces 22*a* and 23*a* respectively serving as a rearward extension of one side of the slot. Surfaces 22*a* and 23*a* are arcuate as seen best in Fig. 5. Plastic plates 22' and 23' are attached by screws to blocks 22 and 23 respectively.

Heating blocks 22 and 23 are rigidly attached by screws 24 to arms 25 and 26 respectively which are each pivotally mounted at an end to vertical member 14 by bolts, bolt 27 serving as the pivotal connection for arm 25 and bolt 28 serving as the pivotal connection for arm 26.

Linking member 29 is pivotally connected at one of its ends to heating block 22 on the side of the block which is away from surface 22*a*. The other end of linking member 29 is pivotally connected to member 30 which is pivotally attached to base 16, by bolt 31 which is maintained in position by hinge 32.

Spring 33 is attached to the top of heating block 22 at a point above the point whereat linking member 29 is pivotally connected to the block. The other end of spring 33 is attached to vertical member 14 at a point above member 30. Spring 33 maintains member 30 in a vertical direction by yieldingly urging it against stop 34 which is fastened to vertical member 14. Linking member 29 is so constructed that when upright 30 is against stop 34, heat block 22 is held away from the center line of slot 17.

Heating block 23 is mounted in exactly the same way as heating block 22. Linking member 35 is pivotally connected at one of its ends to heating block 23 on the side of the block which is away from surface 23*a*. The other end of linking member 35 is pivotally connected to a member 36 which is pivotally attached to base 16 by bolt 37 which is maintained in position by hinge 38.

Spring 39 is attached to the top of heating block 23 at a point above the point whereat linking member 35 is pivotally connected to the block. The other end of spring 39 is attached to vertical member 14 at a point above member 36. Spring 39 maintains member 36 in a vertical direction by yieldingly urging block 23 away from the center line of slot 17.

Lever 40 is rigidly connected to the lower portion of member 36. Lever 40 and member 36 are connected in such a way that when member 36 is vertical lever 40 makes an angle of approximately 30° with the horizontal. Likewise, lever 41 is rigidly connected to the lower portion of member 30 in such a way that when member 30 is vertical, lever 41 makes an angle of approximately 30° with the horizontal. As seen in Fig. 2 lever 41 extends upwardly at an angle with its uppermost portion in the vicinity of top plate 19. Shelf member 42 is rigidly attached to the upper end of lever 41 in such a way that shelf member 42 lies perpendicular to vertical member 14. Lever 40 extends upwardly at an angle to a point whereat its uppermost end lies slightly beneath the surface of shelf member 42. Bar 43 which is mounted on lever 40 at its end serves to maintain the end of lever 40 adjacent lever 41, since the upper end of lever 41 lies between bar 43 and lever 40 and the bottom edge of lever 41 rests on circular member 43' which is mounted between lever 40 and bar 43. Spring 39 therefore cannot draw member 23 away from slot 17 since member 30 lies against stop 34.

As will be seen below, when the operation of the device is considered, the construction of levers 41 and 40 is such that upon clockwise rotation of lever 41 as seen in Fig. 2 lever 40 will be rotated counterclockwise since the lower edge of lever 41 bears against circular member 43' and bar 43 will maintain lever 40 in sliding position adjacent lever 41.

Conductor 44 connects rheostat 45 to any conventional source of electrical power such as 115 volts 60 cycle A.C. voltage. Rheostat 45 can be any conventional type rheostat having a control 46 by means of which the flow of electrical power therethrough can be regulated. Lead 47 connects heating element 48 to the power source through rheostat 45 and conductor 49 connects heating element 50 to the source of electrical power through rheostat 45. Thus, the temperature of heating elements 48 and 50 is regulated by rheostat 45.

The manner of sealing the film at the ends of a package with my apparatus will be now considered. Power is supplied to rheostat 45 and control 46 is operated so that the heating elements heat their respective heating blocks to a temperature slightly higher than the melting point of film 11. Article 10 is positioned on platform 12 in such manner that end 11*b* is adjacent slot 17. An operator then grasps end 11*b* with one hand as shown in Fig. 5 and places the fingers of his other hand on end 11*b* adjacent article 19. End 11*b* is then placed in 17 as shown in Fig. 5 and as this end is brought in contact with shelf 42, levers 41 and 40 operate to bring heating blocks 22 and 23 in contact with envelopes 11*b*, thus heat sealing areas of the film a predetermined distance from article 10.

Since both hands of the operator will usually be used to place the end of the wrapper between the jaws of the apparatus, one hand will be between the heat crimped area and the body of the wrapped article. This means that the heat crimped area can be maintained at a predetermined distance such as 2 or 3 inches from the end portion of the wrapped article.

Knife edge 51 as seen in Fig. 5 severs the extreme end of envelope 11*b* cleanly. Lever 41 is released as the operator removes his hand from it so that heating blocks 22 and 23 will return to their original positions without applying such excessive heat to envelope 11 that it melts through at the points of contact of heating blocks 22 and 23 with this envelope.

Plastic plates 22' and 23' serve as an auxiliary crimping means and accomplish a slight degree of heat sealing at the points at which they come in contact with envelope 11 since the heat of blocks 22 and 23 is transferred to these plates by means of conduction. The temperature of the plastic plates due to their composition, however, is always lower than the metal and never sufficiently hot to melt through the film.

It should be understood that this operation can be accomplished almost equally well without the use of knife edge 51.

After end 11*b* has been heat crimped, end 11*a* is also heat crimped in the same manner and the wrapped article appears as shown in Fig. 6. Thus, heat sealing end film closure has been accomplished at a distance spaced from the end of the product packaged. If the wrapper is to be shrunk the article is then subjected to heat as by being submerged in water heated to from 180° to 210° Fahrenheit and the envelope 11 shrinks so that a taut package such as that shown in Fig. 7 will result since excess air within the package has been expelled through the overlapping seams of the film or punched holes in the wrapper if it is so desired.

The relative positions of the heat crimped or heat sealed areas 11*a* and 11*b* prior to heat shrinking is shown in Fig. 6 with the sealed areas spaced from the ends of the wrapped article. Fig. 7 shows the package after heat shrinking with the wrapper stretched tightly around the packaged article and with the heat sealed areas disposed immediately adjacent the article.

Fig. 8 illustrates another form of heating block. In Fig. 8, heating block 52 with heating element 53 therein and heating block 54 with heating element 55 therein are used rather than the heating blocks aforedescribed. It is to be noted that heating block 54 has thereon at the surface adjacent the envelope a contact point 56 while heating block 52 has at the edge of it which is adjacent the envelope contact point 57. In Fig. 8 contact point 57 is spaced away from the adjacent heating block 54 and contact point 56 is in direct contact with its adjacent heating block 52. This assembly provides a lesser degree of pressure at 57, thus minimizing a melt through and providing a crimp only whereas a completed contact at 56 under pressure serves as a severing means at the

same time the heat sealing function is performed. Thus, it is unnecessary with the embodiment shown in Fig. 8 for a cutting blade to be provided.

It is seen in Fig. 4 that Teflon strip **58** is attached at one of its ends to heating block **22** and at its other end to heating block **23**. Weight **59** maintains the center portion of strip **58** below slot **17** so that the Teflon strip covers surfaces **22***a* and **23***a* of heating blocks **22** and **23** respectively. This Teflon strip allows for a more even distribution of heat when the heating blocks are applied to an envelope. This feature is optional and its use is dependent on the type of film being used, degree of heat required, and the speed at which it is desired the unit operate.

It should also be noted that even though slight amounts of air may be trapped inside the package after it has been heat treated the constant pressure exerted by the shrunk film will eventually force this air out through the seams of the package or through voids deliberately created for air expulsion.

Thus, among others, the several objects in the invention as specifically aforenoted are achieved. Obviously, numerous changes in construction and arrangement of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. An apparatus for applying heat to an end of an article wrapper including in combination a mounting, a heating block pivotally connected to said mounting, a second heating block also pivotally connected to said mounting, means to heat said heating blocks, guide means formed in said mounting, spring means yieldingly urging said first heating block away from said guide means, second spring means yieldingly urging said second heating block away from said guide means, stop means capable of limiting the distance said first block can travel away from said guide means, second stop means capable of limiting the distance said second block can travel away from said guide means, lever means connected to said first block whereby said block can be pivoted toward said guide means, and second lever means connected to said second block whereby said second block can be pivoted toward said guide means, said first and second lever means being operatively interconnected so that when said first lever means is operated said second lever means is also operated and said first and second heating blocks are brought together and in contact with the end of said article wrapper which is disposed in said guide means.

2. Apparatus for applying heat to the projecting end of an article wrapper as set forth in claim 1 in which a strip of flexible material is secured to the first and second heating blocks and extends downwardly over the confronting faces thereof forming a bight and a weight is positioned in the bight portion of the strip to maintain the strip in relatively taut condition.

3. An apparatus for applying heat to an end of an article wrapper including in combination a mounting, a heating block pivotally connected to said mounting, a second heating block also pivotally connected to said mounting, said first and second heating blocks being in spaced relation with one another, a surface on said first heating block opposite said second heating block, a second surface on said second heating block opposite said first surface, means to heat said heating blocks, guide means formed in said mounting, spring means yieldingly urging said first heating block away from said guide means, second spring means yieldingly urging said second heating block away from said guide means, stop means capable of limiting the distance said first block can travel away from said guide means, second stop means capable of limiting the distance said second block can travel away from said guide means, a lever pivotally mounted on said mounting, linking means connecting said lever to said first heating block, a second lever pivotally mounted on said mounting, second linking means connecting said second lever to said second heating block, and connecting means mounted on said second lever whereby said second lever is operatively connected with said first lever so that when said first lever is operated, said second lever is also operated and said first and second surfaces are brought together and in contact with the end of said article wrapper which is disposed in said guide means.

4. Apparatus for use in heat sealing the projecting end of a package wrapper comprising: a vertically disposed member having a V-shaped guide opening extending downwardly from its upper surface and serving as a guide for the projecting wrapper end; a relatively flat angularly disposed platform for holding the package disposed beneath the guide opening so that the projecting package end may be inserted therein, said platform having connection with said vertically disposed member for relative vertical adjustment; a pair of pressure blocks having heating means shiftably mounted on said vertically disposed member adjacent said V-shaped opening; and means operatively connected to said blocks for shifting them towards each other so that a projecting end of a package wrapper disposed in said guide opening will be engaged and heat sealed by said blocks.

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